Claims

Sub D' cont.

1. A starter generator for an internal combustion engine having a rotor and a stator, whose structural elements substantially comprise layered and joined-together metal sheets.

Sub C' cont.

2. The starter generator of claim 1, characterized in that the structural elements of the rotor (14), individually or combined, include a hub, a bearing seat (16), and a sensor ring for detecting rpm and/or the direction of rotation.

Claim 1

3. The starter generator of ~~one of the foregoing claims~~, characterized in that the structural elements of the stator (12), individually or combined, include a pin bore (24), a bore pattern, and a cooling system (27).

4. The starter generator of claim 3, characterized in that a part of the cooling system (24) is formed by recesses (26) on the outer edge of the stator (12), and the recesses (26) serve to receive cooling tubes (28).

Claim 3

5. The starter generator of ~~one of claims 3 or 4~~, characterized in that the cooling system (27) is accommodated in the interior of the stator (12) (internal cooling).

Claim 3

6. The starter generator of ~~one of claims 3, 4 or 5~~, characterized in that the cooling system (27) is accommodated on the outer edge of the stator (12), and an outer jacket face (34) of the cooling system (27) is

formed by a wall (38) of a gear bell (external cooling).

Sub C1 concl'd. A 7. The starter generator of ~~one of claims 5 or 6~~ claim 5, characterized in that for sealing off the cooling system (27), a sealing means (36) is applied in the region of the jacket faces (34) of the cooling system (27).

8. The starter generator of claim 7, characterized in that the sealing means (36) is an electroplated coating, a heat-resistant and coolant-resistant paint, or a synthetic resin.

9. A method for producing a starter generator for an internal combustion engine having a rotor and a stator, in which the essential structural elements of the rotor and stator are formed by joining layered metal sheets.

Sub C2. 10. The method of claim 9, characterized in that the joining is done by punch packing, welding, adhesive bonding or riveting.

A 11. The method of ~~one of claims 9 or 10~~ claim 9, characterized in that short-circuit bars (18) and/or short-circuit rings (20) are created on the rotor (14) by aluminum casting or copper casting.

B 12. The method of ~~one of claims 9-11~~ claim 9, characterized in that a geometry of the metal sheets for the stator (12) is selected such that after the metal sheets have been stacked on one another, recesses (26) are present, into which cooling tubes (28) are placed.

13. The method of claim 12, characterized in that

the cooling tubes (28) have a knurling on their tube surface, which increases a retention force on the stator (12).

Sub C2 cncl'd.

14. The method of claim 12, characterized in that the cooling tubes (28) are press-fitted into the stator (12).

15. The method of claim 12, characterized in that the cooling tubes (28) are placed in the recesses (26) of the stator (12) and are then widened by means of a mandrel.

A 16. The method of ~~one of claims 9-15,~~ claim 9 characterized in that the geometry of the metal sheets for the stator (12) is selected such that after the metal sheets have been stacked on one another, a cooling system (27) in the interior of the stator (12) is embodied (internal cooling).

A 17. The method of ~~one of claims 9-16,~~ claim 9 characterized in that the geometry of the metal sheets for the stator (12) is selected such that after the metal sheets have been stacked on one another, a cooling system (27) is embodied on the outer edge of the stator (12), and an outer jacket face (34) of the cooling system (27) is formed by a gear bell (external cooling).

B 18. The method of ~~one of claims 16 or 17,~~ claim 11 characterized in that a sealing means (36) is applied in the region of the jacket faces (34) of the cooling system (27).

Add C3